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REMARKS

This response is intended as a full and complete response to the final Office Action mailed June 12, 2006. In the Office Action, the Examiner notes that claims 32-44 are pending and rejected. By this response, all claims continue unamended.

In view of the following discussion, Applicants submit that none of the claims now pending in the application are obvious under the provisions of 35 U.S.C. §103. Thus, Applicants believe that all of these claims are now in allowable form.

It is to be understood that Applicants do not acquiesce to the Examiner's characterizations of the art of record or to Applicants' subject matter recited in the pending claims. Further, Applicants are not acquiescing to the Examiner's statements as to the applicability of the art of record to the pending claims by filing the instant response.

REJECTION OF CLAIMS UNDER 35 U.S.C. §103(a)

Claims 32-44

The Examiner has rejected claims 32-44 under 35 U.S.C. §103(a) as being unpatentable over Mao et al. (U.S. 6,886,178, hereinafter "Mao") in view of Wu et al. (U.S. 6,594,271, hereinafter "Wu"). Applicants respectfully traverse the rejection.

To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (C.C.P.A. 1974). All words in a claim must be considered in judging the patentability of that claim against the prior art. *In re Wilson*, 424 F2d. 1382, 1385, 165 USPQ 494 496 (C.C.P.A. 1970), M.P.E.P. 2143.03. Moreover, the mere fact that a prior art structure could be modified to produce the claimed invention would not have made the modification obvious unless the prior art suggested the desirability of the modification. *In re Fritch*, 23 USPQ 2d 1780, 1783 (Fed. Cir. 1992); *In re Gordon*, 221 USPQ 1125, 1127 (Fed. Cir. 1984).

The test under 35 U.S.C. §103 is not whether an improvement or a use set forth in a patent would have been obvious or non-obvious; rather the test is whether the claimed invention, considered as a whole, would have been obvious. Jones v. Hardy, 110 USPQ 1021, 1024 (Fed. Cir. 1984) (emphasis added). Thus, it is impermissible to

focus either on the "gist" or "core" of the invention, Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc., 230 USPQ 416, 420 (Fed. Cir. 1986) (emphasis added). Moreover, the invention as a whole is not restricted to the specific subject matter claimed, but also embraces its properties and the problem it solves. In re Wright, 6 USPQ 2d 1959, 1961 (Fed. Cir. 1988).

Mao and Wu, singly or in combination, fail to teach or suggest Applicants' invention as a whole.

Applicants' independent claims 32 and 40 recite, respectively:

> 32. In an information distribution system comprising server equipment for providing both content and non-content data to subscriber equipment, said server equipment comprising:
> a multiplex switch for multiplexing a plurality of formatted content streams from server modules to produce an output stream that is adapted for transport via a communication channel, wherein said multiplexing of said formatted content streams is statistically performed; wherein said multiplex switch is further for formatting non-content data and for selectively multiplexing formatted non-content data into said output stream, and wherein said multiplexing of formatted non-content data is on a future bandwidth availability basis that is predicted based on said multiplexing of said formatted content streams. (Emphasis added)
>
> 40. A method of providing content and non-content data to subscriber comprising the steps of:
> statistically multiplexing a plurality of formatted content streams to produce an output stream that is adapted for transport via a communication channel;
> formatting non-content data to fit the output stream;
> predicting future bandwidth availability based on the statistical multiplexing of the formatted content streams; and
> selectively multiplexing formatted non-content data into said output stream on a future bandwidth availability basis. (Emphasis added).

The present invention discloses that the switching module 234 may be able to predict future bandwidth availability and, therefore, give priority to IP packets over video and audio MPEG packets. (See Specification: page 13, lines 8-21.) Specifically, the future bandwidth is predicted based on the multiplexing of the formatted content packets. The prediction allows the formatted non-content data to be multiplexed into an output stream based on anticipated future bandwidth conditions, i.e., irrespective of the current bandwidth condition. The present claims explicitly include the features of

predicting the available bandwidth at a future time and using that information in selectively multiplexing. As stated in the claims, "predicting future bandwidth availability based on the statistical multiplexing of the formatted content streams; and selectively multiplexing formatted non-content data into said output stream on a future bandwidth availability basis."

As stated in the previous response and by the Examiner in the Office Action, Mao does not teach or suggest "predicting future bandwidth availability based on the statistical multiplexing of the formatted content streams; and selectively multiplexing formatted non-content data into said output stream on a future bandwidth availability basis."

Wu fails to bridge the substantial gap between Mao and Applicants' invention. Wu also does not suggest or teach "predicting future bandwidth availability based on the statistical multiplexing of the formatted content streams; and selectively multiplexing formatted non-content data into said output stream on a future bandwidth availability basis."

Wu discloses in column 2, lines 13-18:

> An Opportunistic Data Processor (ODP) has a respective buffer for receiving a respective data source (which can be any type of data, video or otherwise). The multiplexing encoder has a packet multiplexer for receiving encoded data from the channel encoders and the ODP for forming a transport stream, and a quantization level processor associated with the packet multiplexer. The channel encoders and the ODP send their bandwidth need parameters to the quantization level processor, and in response, the quantization level processor provides bandwidth allocations and a global quantization level to the channel encoders and the ODP. The channel encoders and the ODP encode their respective data sources according to the global quantization level and the respective bandwidth allocations. Moreover, the ODP generates its bandwidth need parameter: (a) by scaling its bandwidth need by a function of the global quantization level, and (b) according to a threshold quantization level.
>
> In particular, the ODP generates its bandwidth need parameter such that essentially no bandwidth is allocated to the opportunistic data processor when the global quantization level exceeds the threshold quantization level. The ODP generates its bandwidth need parameter such that bandwidth is allocated to the opportunistic data processor only when the global quantization level is less than the threshold quantization level.

Wu discloses in column 4, lines 38-47:

> The TSPs provide their respective encoded source data to the PM 140 to form a transport stream, such as one that conforms to the MPEG-2 standard.
>
> The ODP system 180 includes a file server 150, which stores the opportunistic data, and an Opportunistic Data Processor (ODP) 160, which encodes the opportunistic data and

forwards it to the packet multiplexer 140 for inclusion in the transport stream at specific times when spare bandwidth is available. The file server 150 forwards its data to the ODP 160 in response to a flow control signal.

Wu discloses in column 5, lines 10-52:

The ODP 160 applies a flow control signal to the file server 150 to stop the data feed when the buffer 162 is full, that is, when opportunistic bandwidth is not available.

Based on information received from QLP 130, such as the global QL, the ODP 160 determines when the TSPs do not need all available bandwidth of the transport stream. At these times, the ODP 160 packetizes the opportunistic data and sends the resulting packets to the PM 140 for inclusion in the MPEG-2 transport stream.

A user interface 108 may be incorporated as part of the UCS software, e.g., to allow the user to set a non-zero min_br value to guarantee a minimum data bandwidth.

The ODP 160 implements an opportunistic data rate control algorithm for setting its bandwidth in accordance with the present invention. The goal of the opportunistic rate control algorithm is to minimize the impact on the quality of the regular video services, while using any excess available bandwidth for the opportunistic data. Thus, the opportunistic data is enabled only when the global QL of the multiplex drops below a threshold, where any further decrease in the QL value contributes little improvement to the video quality.

With most statistical multiplexing algorithms, each TSP 115, 120, . . . , 125 periodically sends statistical information to the QLP 130, including, e.g., a "need parameter" that indicates the bandwidth need of the TSP, the maximum bit rate (max_br) and the minimum bit rate (min_br) allowed by the TSP at the current buffer level that guarantee both the encoder's buffer and the decoder's buffer do not underflow or overflow. The need parameter may be based on the TSP's buffer fullness level, for example. Generally, as the buffer fullness level increases, its need parameter increases to avoid a buffer overflow.

The QLP 130 then calculates a global QL value, and broadcasts this global QL value to all TSPs, e.g., via path 135. A global QL may be determined as discussed, e.g., in U.S. Pat. No. 5,216,503 to Paik et al., incorporated herein by reference, wherein a look up table outputs a global QL in response to data indicative of the total amount of data in each channel encoder's buffer. Alternatively, the QLP 130 may calculate the global QL based on an average of the quantization levels received from the TSPs.

Wu discloses in column 6, lines 17-27:

The global QL value is thus computed based on all the TSP's need parameters. Moreover, the ODP 162 also provides a need parameter to the QLP 130 for use in determining the global QL. However, the ODP 162 "tricks" the QLP 130 into assigning it bandwidth only when the ODP 160 determines that excess (spare) bandwidth that is not being used by the TSPs is available. This is achieved by having the ODP 160 send a zero need parameter to the QLP 130 even when the ODP 160 has data to send, but when it has determined that no excess bandwidth is available.

Thus, the Examiner asserts that Wu teaches data, such as formatted opportunistic data and encoded source data, are provided for multiplexing after the

bandwidth is determined/assigned. Then, the Examiner incorrectly concludes that those sections of the Wu reference broadly read on the present invention as claimed.

Providing data after bandwidth determination/allocation as taught by Wu is not equivalent to predicting future bandwidth availability of the present invention. Predicting future bandwidth availability implies anticipating the availability of bandwidth at a time in the future. It is not the same as determining/allocating current bandwidth availability for providing data at a future time. Thus, Wu is silent on predicting future bandwidth availability. The setting of the bandwidth in Wu is based on the amount of available bandwidth at the time of the transmission. Wu does not calculate, determine, forecast, estimate, anticipate or predict what the bandwidth condition will be like in the future and multiplex data with respect to that prediction.

Thus, Mao and Wu, singly or in combination, fail to teach or suggest the invention as a whole. As such, Applicants submit that independent claims 32 and 40 are not obvious and fully satisfy the requirements of 35 U.S.C. §103 and are patentable thereunder.

Furthermore, claims 33-39 and 41-44 respectively depend from independent claims 32 and 40 and recite additional limitations thereof. As such, and at least for the same reasons as discussed above, Applicants submit that these dependent claims are also not obvious and fully satisfy the requirements of 35 U.S.C. §103 and are patentable thereunder. Therefore, Applicants respectfully request that the Examiner's rejections be withdrawn.

THE SECONDARY REFERENCES

The secondary references made of record are noted. However, it is believed that the secondary references are no more pertinent to Applicants' disclosure than the primary references cited in the Office Action. Therefore, Applicants believe that a detailed discussion of the secondary references is not necessary for a full and complete response to this Office Action.

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CONCLUSION

Thus, Applicants submit that none of the claims presently in the application, are obvious under the provisions of 35 U.S.C. §103. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues requiring adverse final action in any of the claims now pending in the application, it is requested that the Examiner telephone Eamon J. Wall or Jasper Kwoh at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

Dated: 7/28/06

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